

Reflections on Time Travel

One can conceive the possibility of travelling into the past, avoiding the generation of logical contradictions such as the Grandfather Paradox and the like. In such scenarios, time is radically “split” into the “subjective” time of the timetraveller and the “objective” time of the rest of the universe. In fact this oversimplifies the matter. Think of worldlines (spacetime trajectories) of objects as being parametrized by objective time. Then the worldline of any conscious entity is already “split” into two components: the objective time associated with the objective temporal parameter, and the subjective temporal flow of the entity’s consciousness. In undertaking a journey into the past, the timetraveller’s worldline, formerly directed into the future along with the worldlines of the rest of the objects in the universe, becomes redirected into *their* past. Yet, supposing the timetraveller’s trip into the past not to be instantaneous, during its trip time will elapse *for it* in the usual way and will still be split into subjective and objective components. While the subjective component is simply a continuation of the subjective temporal flow of the timetraveller’s consciousness before embarking on its journey into the past, the nature of the objective temporal component is less clear. In travelling into the past, the timetraveller’s worldline has “deviated” from the bundle of worldlines of the rest of the objects in the universe which are still proceeding into their (supposed common) future. It follows that the objective temporal component of the timetraveller’s worldline while undergoing its journey must have a *local* nature: it is a feature of the timetraveller’s worldline which is not shared by the worldlines of the rest of the objects in the universe travelling into the common future. But, despite its locality, its objectivity is indisputable since, for example, during the trip the timetraveller’s body ages and its chronometer advances.

An old man may in principle step into a time machine and revisit the past, even *his* past, but when he steps out of the machine he is no younger *himself* than when he entered it. In that respect there is no essential difference between the “objective” temporal journey and from the summoning up of the past through memory, or the contemplation of photographs of one’s younger self. Gazing at a photograph of myself taken in my twenties, at a party, say, I might wish to be again the young man in the photograph. Now by this I surely do not mean that my present older self should employ a time machine to travel into the past and crash the party. (There, of course, I would have the curious experience of encountering my

younger self, with the attendant problems of self-duplication.) In fact the wish to be young again could reasonably be taken to have two meanings. One is easily understood. It is the purely physical desire that one's body (and, perhaps, one's emotional perspective) should be restored to the state it was when one was younger. A possible way of achieving this is for my present older consciousness to be projected onto, or injected into, my past self in such a way as to share the mental space occupied by my past self. If both consciousnesses – past and future – were aware of the presence of the other, the principle of the unity of consciousness would be violated, possibly leading to joint mental breakdown. Another possibility is that the older self gains access to the contents of the consciousness of the younger self while the latter remains unaware of the presence of the older consciousness. (This possibility is explored in Olaf Stapledon's novel *First and Last Men*.)

The wish to be young again could also be taken in the *literal* sense that my present older self should somehow come to *coincide in the present* with my younger self. This could be achieved by having both objective *and* subjective time *run backwards* in such a way as to induce my present self to metamorphose into my younger self. In classical mechanics this could, in principle, be done by reversing the direction of motion of all the particles in the universe. The result can be compared with a film run backwards. A good illustration here is Jean Cocteau's film *Orphée*. Cocteau shows his characters passing into the world of death by stepping through mirrors, and when he wants a character to spring back to life, he simply runs the film backwards. A memorable line from the film, bitter in its truth, is: *Mirrors are the doors through which death comes and goes. Look at yourself in a mirror all your life and you'll see death do its work*. Suppose that Cocteau had actually filmed someone staring into a mirror for his whole life and then reversed the film. One would see the person initially as old, and then, through time-reversal, slowly undergo a transformation into his younger self. This an objective, observable effect. If sound recording had been used, the person's utterances would be reversed, and so become unintelligible as actual speech, but they would still be objective as sounds. Objectively, then, time-reversal seems clear enough. But *subjectively*, the effect of time-reversal is most unclear. What would it mean for the person's consciousness to "run backwards"? Of course, this question does not arise in the case at hand because the film only provides a record of the appearance of the person's body and sound of his speech as it varies in *objective* time. No recording has been made of the flow of thoughts in the person's consciousness as it varies in (that person's)

subjective time. But even if that subjective flow could be “recorded” in some way, it is not at all clear what temporal reversal would mean *from a subjective point of view*. The closest one can come to this seems to be the effort one sometimes makes in memory to return to a previous point in the flow of one’s thoughts, for example when one attempts to trace the source of a thought by summoning up previous mental associations, a process that Freud and Proust had both mastered in their different ways. But of course this is not done by “reversing” the flow of consciousness. It is not the subjective temporal equivalent of tying a knot and then untying it. In attempting to return through memory to a previous point in one’s conscious life the flow of consciousness still proceeds “forward”. What memory presents is a discrete *chain* of previous associations, from which the continuous flow accompanying their actual emergence in one’s mind has been discarded. Nevertheless, the consciousness in which the memory operates in the “now” is always continuous, even if its object of attention, in this case a sequence of previous associations, is discrete.

The fact is that if one’s wish to be young again requires that objective *and* subjective time *run backwards* in such a way as to induce one’s present older self to metamorphose into one’s younger self, then that would also seemingly require the obliteration of one’s older self (and, perhaps, everything contemporaneous with it.) But this would amount to truncating the universes’ past at the time the photograph of one’s younger self was taken; in other words, chopping off all the worldlines of objects (including, of course own body along with its consciousness) at that time. This, of course can be achieved *subjectively* in memory, as Proust records in *A la recherche du temps perdu*. One can recall one’s past self, and imagine returning to the state of that past self, at the same time summoning up the universe in which that past self was immersed, thus obliterating the future. *Objectively*, this “truncation” of world-lines can be illustrated by the cutting back of a vine. At any given moment, the vine in its entirety displays all of its stages of growth up to that moment. When it is cut back, each of its tendrils (and so the whole vine, if the cutting is performed uniformly) is “returned” to a stage of growth corresponding to an earlier time.